

KIELANOWSKI, Tadeusz

Phthisiatrics of pneumatology. Polski tygod. lek. 11 no.27:
1235-1237 2 July 56.

1. Z Kliniki Ftyzjatrycznej Akademii Medycznej w Gdansku, kierownik:
prof. dr. T. Kielanowski. Gdańsk, Akad. Med. Klinika Ftyzjatryczna.
(TUBERCULOSIS, PULMONARY,
replacement of term phthisiatrics with pneumatology (Pol))

Kielanowski, T.

KIELANOWSKI, T.; BROKMAN, S.; DOWGIRD, A.; FAFROWICZ, B.

Five years at the Phthisiological Hospital of the Academy of Medicine
at Bialystok. Gruzlica 25 no.3:251-253 Mar 57.
(TUBERCULOSIS, PULMONARY, statist.
hosp. statist. (Pol))

KIELANOWSKI, Tadeusz

Typhobacillosis Landouzy, spurious syndrome of symptoms of
non-localized acute tuberculosis. Gruzlica 28 no.8:641-644
Age 60.

1. Z Kliniki Ftyzjatrycznej A.M. w Gdansku Kierownik: prof. dr
T.Kielanowski.
(TUBERCULOSIS diag.)

KIELARSKI, Eugeniusz

Ten years in Polish geological service. Przegl geol 11 no.4:173-177
Ap '63.

1. Dyrektor Wydawnictw Geologicznych, Warszawa.

MARCZYNISKI, Jozef, mgr inz.; KIELB, Szczepan, mgr inz.

The Bipromet Designing Office of Nonferrous Metallurgy. Rudy i
metale 9 no.7:370-377 Jl '64.

1. Director, Bipromet Designing Office of Nonferrous Metallurgy
Katowice (for Marczynski).
2. Chief Engineer, Bipromet, Katowice.

KIELBASINSKI, A. (Warszawa)

On the iterative procedures of best strategy for inverting
a self-adjoint positive-definite bounded operator in
Hilbert space. Studia math 24 no.1:13-23 '64.

"APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000722510020-2

BURNAT, M.; KIELBASINSKI, A.; WAKULICZ, A.

The method of characteristics for a multidimensional gas flow. Archiw. mech. 16 no.2:179-187 1964.

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000722510020-2"

CWIRKOWSKA, L.; KIELBASINSKI, J.; SAWLEWICZ, K.

Nuclear fission; a bibliography. Pol atom energy review no.7:
1-87 '63

1. Information Center of the Polish Atomic Energy Commission,
Warsaw.

KIELBASINSKI, L. [Kielbasinski, L.] (Varshava)

The Polish sector of the "Druzhba" pipeline in operation. Stroi.
truboprov. 9 no.12:12-13 D '64. (MIRA 18:3)

KIELBASINSKI, S.

FACTS OF AND EXPECTEDS OF

30

Synthetic rubber from alcohol. Stanislaw Kielbasiński. *Przemyśl. Chem.* 4, 384 (1948); cf. *C.A.* 41, 7802. Historical. K. C. participation in Russian and Polish research on butadiene from EtOH and on synthetic rubber during 1913-39 is described. Frank Gonet

ASIA-SEA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000722510020-2"

KIELBASINSKI, W.

POLAND/Chemical Technology - Chemical Products and Their
Application, Part 4. - Artificial and Synthetic
Fibers.

H-31

Abs Jour : Ref Zhur - Khimiya, No 7, 1958, 23440

Author : W. Kielbasinski, A. Kaszynski

Inst : -

Title : Comparative Data of Reaction Duration in Some Continuous
Action Equipment for Viscous Fiber Production.

Orig Pub : Przem. chem., 1957, 13, No 5, 249-256

Abstract : Bibliography with 4 titles.

Card 1/1

KIELBASINSKI, Witold, mgr inz.

World prospects for cut viscose fiber. Chemik 16 no.3:72-75
Mr '63.

1. Instytut Włokien Sztucznych i Syntetycznych, Łódz.

KARSKIENSKI, Witold, mgr inż.

Problem of developing the production of viscose cords in the
light of the progress in the production of automobile tires.
Chemik 17 no.3:99-103 Mr '64

1. Institute of Artificial and Synthetic Fibers, Kraków.

POLAND / Chemical Technology. Chemical Products and H-26
Their Applications. Carbohydrates and Their
Processing.

Abs Jour: Ref Zhur-khimiya, No 3, 1959, 9920.

Author : Kielbaska, J.
Inst : Not given.
Title : Cane sugar Industry in India.

Craig Pub: Gaz. cukrown., 1958, 60, No 2, 47-50.

Abstract: Characteristics of the industry, description of
the refining technology and use of waste products.
-- Ya. Shteynberg.

Card 1/1

206

ALMIRENSKA, Stefania; PIATKOWSKI, Zbigniew

Ovarian neoplasms according to data of the Institute of Theology
in Warsaw (1947 - 1957). Nowotwory zd no. 4:367-374 (w.d. 16)

1. w Oddziale Onkologii Ginekologicznej Instytutu Onkologii w
Warszawie (Kierownika doc. dr. med. I. Tarłowska) i z Oddziału
Rentgenoterapii (Kierownika doc. dr. med. W. Cukiersztaji; Dyrekt-
ora prof. dr. med. W. Jasinski).

SMIGIELSKI, J.; KIELBINSKI, J.

Preliminary results of investigations on magneto-gas-dynamic phenomena in the case of pulsating combustion. Bul Ac Pol tech 12 no. 3:211-218 '64.

1. Institute of Fluid Flow Machines, Gdansk, Polish Academy of Sciences. Presented by R. Szewalski.

KIELBINSKI, M., mgr. inz.

"The proper selection of machine tools for machining" by
Friedrich Frey. Reviewed by M. Kielbinski. Mechanik 35
no.8:467 Ag '62.

KIELBINSKI, M., mgr inz.

"Grinding machine" by M. Korycinski, M. Czarniawski. Reviewed
by M. Kielbinski. Mechanik 35 no.12:683 D '62.

KIELERATOWSKI, J.

Damages to locomotives en route in the 1st half, of 1956.

P. 269 (Przeglad Kolejowy Mechaniczny. Vol. 8, no. 9, Sept. 1956, Warszaw, Poland)

Monthly Index of East European Accessions (EEAI) LC. Vol.7, no. 2,
February 1958

KIELBARTOWSKI, J.

The progress in railroad traction in the Soviet Union.

P. 290 (Przeglad Kolejowy Mechaniczny. Vol. 8, no. 10, Oct. 1956, Warszawa, Poland)

Monthly Index of EastEuropean Accessions (EEAI) LC. Vol. 7, no. 2,
February 1958

KIELBIAKOWSKI, Josef, inż., MSc

Research on the dynamic action of rail vehicles on the tracks.
Przegl kolej mechan 13 no.1:27-29 Ja '61.

KIEBRATOWSKI, Jozef

Development of combustion engine traction. Przegl kolej mechan 14 no.9:
263-268 S '62.

1. Centralny Osrodek Budowy i Rozwoju Techniki Kolejnictwa, Warszawa.

KIELBRATOWSKI, Jozef, mgr inz.

Automatic couplers. Przegl kolej mechan 13 no.10:301-304
0 '61.

KIELBROWSKI, Jozef, mgr inz.

Testing draft installations in locomotives. Przegl kolej
mechan 13 no.7:205-209 Jl '61.

KIELBRATOWSKI, Józef

Railroad passenger cars, COB-M3 type. Przegl kolej mechan
11 [i.e. 16] no. 3:74-76 Mr '64.

1. Central Institute for Research and Development of
Railway Techniques, Warsaw.

KIELBRATOWSKI, Jozef

Heating of the slide bearings of freight cars on electrified lines.
Przegl kolej mechan 11 no.10:232-236, 245 0 '64

1. Central Institute for Research and Development of Railway
Techniques, Warsaw.

MILGROM, Feliks; GOLEBIOWSKA, Janina; KIELCZEWSKA, Halina

Studies on parabiosis. I. Effect of antihistaminics.
Arch. immun. ter. dosw. 3:393-396 1955.

1. Instytut Immunologii i Terapii Doswiadczałnej PAN we
Wrocławiu (Dyrektor: prof. dr. L. Hirszfeld) Dział Immunologii
Szczegolowej (Kierownik: prof. dr. F. Milgrom).

(ANTIHISTAMINICS, effects,
on survival of mice in parabiosis (Pol))

(PARABIOSIS,
eff. of antihistaminics on survival of mice in
parabiosis (Pol))

MANSKI, Wladyслав; KIRŁEWSKA-RDULTOWSKA, Halina

Compound complement in Wassermann reaction. Med. dosw. mikrob. 10 no.3:
321-326 1958.

l. Z Instytutu Immunologii i Terapii Doswiadczonej im. Ludwika Hirszfelda.

(WASSERMAN REACTION,
compound complement (Pol))

KIELCZEWSKA-RDULTOWSKA, Halina

Occurrence and properties of bacteriophages specific for the genus
mycobacterium. Arch.immun.ter.dosw. 9 no.3:551-571 '61.

1. Department of Medical Microbiology, School of Medicine, Warsaw.

(MYCOBACTERIUM) (BACTERIOPHAGE)

KIELCZENSKA, MARIA

Kielczewska, Maria. O podstawy geograficzne Polski. Poznań, Wydawn. Instytutu Zachodniego, 1946. 146 p. (Prace Instytutu Zachodniego, nr. 10) (Poland's geographic bases. Maps)

SO: Monthly list of East European Accessions, LC, Vol. 3, No. 1, Jan. 1954. Uncl.

"APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000722510020-2

KIELCZENSKA-ZALEWSKA, Maria

JANUSZKO, Zbigniew and KIELCZENSKA-ZALEWSKA, Maria: Województwo Śląskie --
Outline of Economic Geography, Warsaw: Państwowe Wydawnictwo
Naukowe, 1955. 109 pp.

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000722510020-2"

KIELCZEWSKA-ZALESKA, M.

KIELCZEWSKA-ZALESKA, M. A joint conference and courses of the Institute of Geography, Polish Academy of Sciences, and the Ministry of Higher Education devoted to problems of economic geography. p. 678.

Vol. 28, no. 3, 1956
ATLAS POLSKICH STROJOW LUDOWYCH
Poland

So: East European Accession, Vol. 6, No. 5, May 1957

KIELCZEWSKA-ZALESKA, Maria

Trends in the development of anthropogeography in Poland, Przegl
geogr 30 no.3:403-419 '58. (EEAI 9:8)
(Poland--Anthropogeography)

KIELCZEWSKA-ZALESKA, Maria

The problem of the economic changes of small towns in Poland. Przegl
geogr Suppl.to 32:211-220 '60. (EEAI 10:4)

1. Academie Polonaise des Sciences, Institute de Geographie,
Varsovie.
(Poland--Cities and towns)

KIEŁAZEWSKA-ZALESKA, Maria

New trends in historicogeographical studies on rural settlements,
Przegl. geogr. 35 no.1:3-19 '63.

KIELCZEWSKA-ZALESKA, Maria

"Village, field, and farming in the territories of the great valleys and plateaus east of the Elbe River" by A. Krenzlin. Reviewed by Maria Kielczewska-Zaleska. Przegl geogr 35 no.1:102-106 '63.

KIELCZEWSKA-ZALESKA, Maria

"Town planning activities of Polish magnates and noblemen in Poland of the 18th century" by W.Trzebinski. Reviewed by Maria Kielczewska-Zaleska. Przegl geogr 35 nc.4:729-732 '63.

Maximilien Sorre, 1880-1962. 751-752

KIELCZENSKA-ZALEWSKA, Maria

Development of geographic studies on the rural colonization
in Poland. Czasop. geograf. 35 no. 3/4:337-353 '64

With reference to Professor G. Shabot's visit to Poland.
Ibid. 3451

KING TUTANKHAMUN, Valley, Egypt, 2

Geographic coordinates: 26° 30' 30" N, 30° 25' 00" E
Republic of Egypt, 36 km. SW Luxor, 100 m. E.



KIELCZEWSKI, B

"Oilseed Plant Culture On Light Soils." p.20 (Plon, Vol. 5, No. 2, Feb. 1954,
Warszawa)

so: Monthly List of East European Accessions, Library of Congress, Vol. 3, No. 6
June 1954
1953, Uncl.

POLAND / General and Specialized Zoology - Insects.

Abs Jour : Ref Zhur - Biologiya, No 5, 1959, No. 20892

Author : Kielczewski, Bogdan
Inst : Poznan Society of the Friends of Science
Title : The Bioecology of Thrips lini Lind.

Orig Pub : Prace Komis. nauk roln. i lesn. Poznanskie
towarz. przyjaciol nauk, 1957, 3, No 8, 14s

Abstract : In 1945, in Poland the mass appearance of
the flax thrips was noted. In 1953-54, in
the Poznan area, the first insects of
Thrips appeared in the middle of May and the
last on September 2nd, after the flax was
harvested. In fighting the Thrips, the
early use of DDT and hexachlorocyclohexane
is advised, but is not expedient in late
summer when the parasites of Thrips make an

Card 1/2

41

KIELCZEWSKI, Bohdan (Poznan)

Biological rhythms of the organism. Wszechswiat no. 2:
41-42 F '65.

KIELCZEWSKI, Bogdan; CZAKSKA, Maria

Etiology of ectoparasites during daily rhythm. Wied. parazytol. T. no. 1:183-187 '65.

1. Katedra Ochrony Lasu Wydziału Sztaty Rolniczej, Poznań.

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000722510020-2^{M-4}

POLAND / Cultivated Plants. Commercial Sugar Bearing.

Abs Jour : Ref Zhur - Biologiya, No 2, 1959, No. 6348

Author : Horodyski, Andrzej; Jablonski, Miron;
Kielczewski, Bogdan

Inst : Not given
Title : The Effect of the Sowing Density on the Yield
of Seeds and the Oiliness of Sunflowers with
Varying Degrees of Fertilization

Orig Pub : Wydawn. własne, Inst. uprawy, nawożenia i
globoznawstwa, 1957, No 61, 146-161

Abstract : Field experiments, carried out on an experimental field in Przibrode in 1951-1953 with the Bronovskiy Polosatyy (striped) variety are described in this paper. The lowest level of fertilization corresponded to P₃₀K₆₀N₂₀ and

KIELCZEWSKI, Bogdan

Studies on parasitic mites in wild rodents. Wiadomości parazyt., Warsz.
4 no.3:207-210 1958

1. Z Zakladu Ochrony Lasow Wyższej Szkoły Rolniczej w Poznaniu.
(MITES,
parasitism on wild rodents (Pol))
(RODENTS,
mites parasitism in wild cond. (Pol))

DEMBINSKI, F.; JABLONSKI, M.; HOFFMANNOWA, A.; KIELCZEWSKI, B.

Effect of the width of plant rows on seed yields of three domestic
castor-oil plant varieties. Rocznik nauk roln. 81 no. 3: 545-560
'60. (EEAI 9:10)
(Poland--Castor-oil plant)

KIELCZEWSKI, Bohdan; WISNIEWSKI, Jerzy

Research on the acarofauna of nests of *Formica rufa* L. and
Formica polyctena Först. with reference to the accompanying
Arthropoda. Prace nauk roln i lesn 13 no.1:3-14 '62.

1. Katedra Ochrony Lasu, Wyższa Szkoła Rolnicza, Poznań.

KIELCZEWSKI, Bohdan, prof. dr

Symposium of sport biometeorology. Problemy 20 no.11:698-
699 1964.

KIELCZEWSKI, Bohdan; KASHYNA, Edmund

Acarofauna of the coniferous cultures and saplings of the Zielonka Experiment Forest District of the School of Agriculture. Prace nauk roln i leśn 17 no.3;377-383 '65.

KIELCZEWSKI, M.

Optical rotatory dispersion of naphthalenesulfinylacetic acids.
Bul chim PAN 12 no.12:849-851 '64.

1. Department of Organic Chemistry of A.Mickiewicz University,
Poznan. Submitted October 7, 1964.

KIEŁCZENSKI, S. ; TOTA, A.

The right criteria of the organization of milling enterprises.

P. 5. (PRZEGŁAD ZROZOWO-MIĘWNARSKI) (Warszawa, Poland) Vol. 1, no 8, Nov. 1957

CC: Monthly Index of East European Accession (EEAI) LC Vol. 7, No. 5, 1958

Kielczewski W.

3866

601.163.123.3 : 545.84

Kielczewski W. Application of an Anion Exchanger for Quantitative Separation of Cations.

"Zastosowanie anionitu do ilościowego rozdzielania kationów", Roczniki Chemii (PAN), No. 3, 1954, pp. 493-498, 3 tabs.

On a resin obtained from urea and formaldehyde, acting as an anion exchanger, a separation, by percolation through a column, was achieved of certain cations present in a solution. On resin saturated with phosphoric anion a separation was achieved of the following pairs of cations: 1) iron-copper, 2) iron-nickel, 3) iron-cobalt. The separation was brought about by secondary reactions taking place between the polyvalent anion retained by the resin and the cation reacting with this anion.

CH

AS
MS

Kielczewski, Wladyslaw

7

POLON

✓ Application of an anion exchanger for quantitative separation of cations. Wladyslaw Kielczewski (Univ. Poznań, Poland). *Zos. Chem.*, 28, 1039 (1954) (English summary).—An anion exchanger wasd. with a multivalent anion sorbs cations. The anion exchanger obtained from urea and formaldehyde was said. in the column with dil. H_3PO_4 , Fe^{+++} in the mixt. with Cu^{++} , Ni^{++} , or Co^{++} was percolated through the column and send. on the exchanger, leaving in the filtrate Cu^{++} , Ni^{++} , or Co^{++} . It is supposed that the reaction is $H_3PO_4 + A$ (anionit) \rightarrow AH_3PO_4 . Fe^{+++} exchanges with one or both H, and gives a new inact. compd.

Victor von Jagdl

CH

Kielczewski, W.

Poland/Analytical Chemistry - Analysis of inorganic substances

G-2

Abs Jour : Referat Zhur - Khimiya, No 3, 1957, 8430

Author : Lewandowski, A. and Kielczewski, W.

Inst : Not given

Title : Microchromatographic Quantitative Estimation of Copper and Lead by the Impregnation Method

Orig Pub : Roczn. chem., 1956, Vol 30, No 1, 2/5-280 (in Polish with summaries in English and Russian)

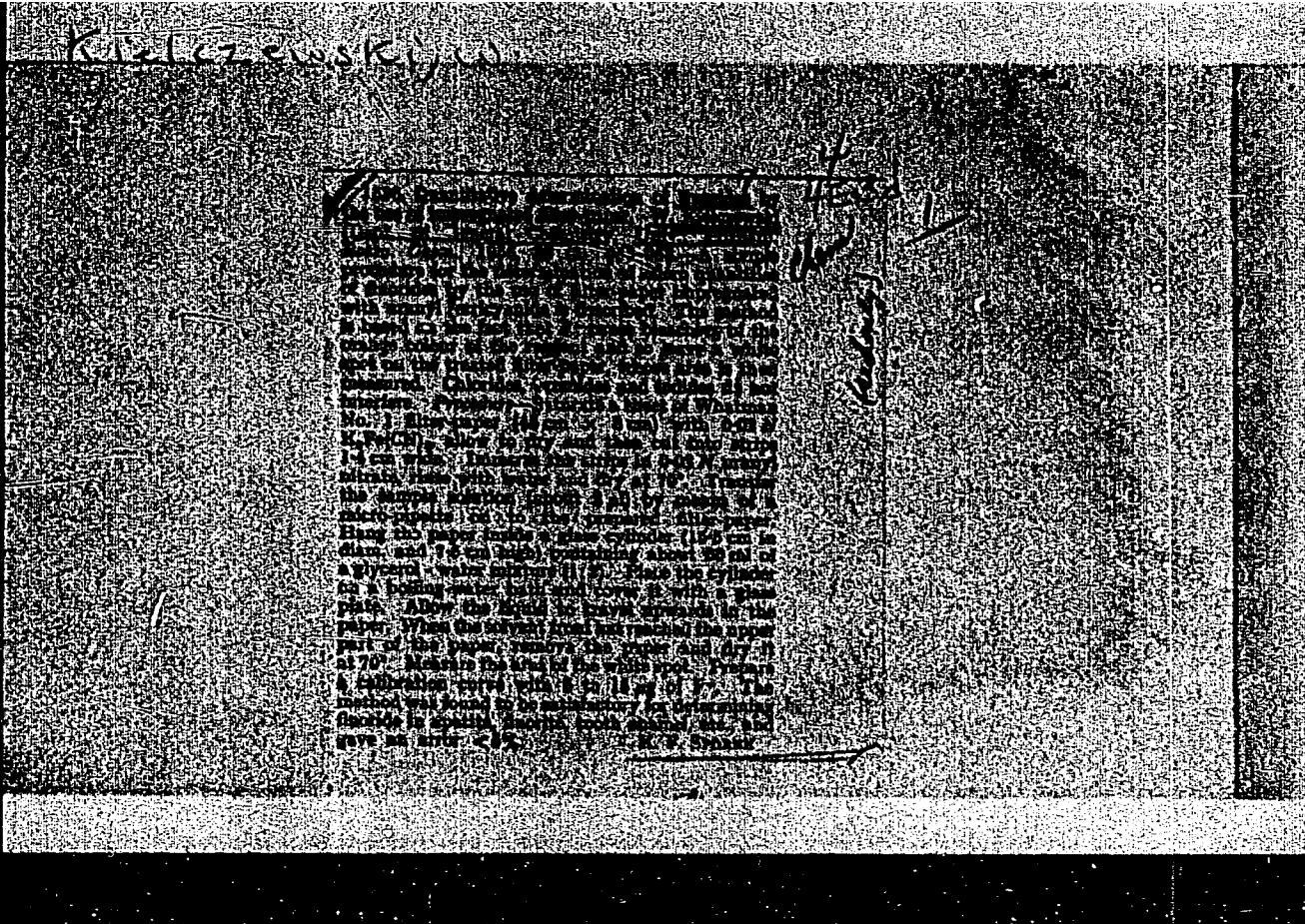
Abstract : Microgram quantities of copper (I), I and zinc (II), lead (III), and III in the presence of II have been determined by paper chromatography. Whatman No 1 paper was used, impregnated with uranyl ferrocyanide or barium iodate (IV). A technique is described for the washing and development of the spots formed by the reaction of the cation under investigation with the impregnating reagent; a method based on the impregnation of the paper with IV is also discussed. It has been established that the amount of the unknown substance is directly proportional to the area of the spot which is produced. The amount of substance in an unknown

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POLAND / Analytical Chemistry. Analysis of Inorganic E-2
Substances.

Abs Jour: Ref Zhur-Khimia, No 1, 1959, 983.

Author : Kielczewski, W.

Inst : Not given.

Title : The Determination of Microgram Quantities of Four-Substituted Sodium Pyro-Phosphate by the Application of Impregnated Paper.

Orig Pub: Chem. analit., 1957, 2, No 4, 336-339.

Abstract: For the determination of $\text{Na}_4\text{P}_2\text{O}_7$ (≤ 15 grams P), filter paper impregnated with copper ferrocyanide is used. The paper is soaked in a 0.005 M solution of $\text{K}_4\text{Fe}(\text{CN})_6$, dried at 70-90°C., is cut into strips of 8 centimeters long and 1.4 centimeters wide, immersed into 0.01 M solution of cupric ni-

Card 1/2

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000722510020-2"

COUNTRY : Poland

CATEGORY :

ABS. JOUR. : RZhim, No. 5 1960, No. 17607

AUTHOR : Kielczewski, W.

INST. : Not given

TITLE : The Determination of Microgram Quantities of Reducing Sugars on Impregnated Paper

ORIG. PUB. : Chem Analit (Poland), 4, No 1-2, 151-155 (1959)

ABSTRACT : 1 ml of reducing sugar (RS) solution containing $\geq 1/40,000$ mol per 100 ml solution, is heated for 3 min with 1 ml of modified Fehling solution (a mixture of two volumes of a solution of 34.6 gms Na-K tartrate and 10 gms NaOH in 100 ml water with one volume of a solution of 6.8 gms $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ in 100 ml water) in a test tube placed in boiling water. After cooling, the Cu_2O is separated from the precipitate by centrifuging at 3,600-4,000 rpm, the precipitate is rinsed with water (3 times 5 ml)

CARD: 1/3

CARD: 2/3

KIELCZESKI, W.

Determination of microgram quantities of reducing sugar by the paper impregnation method. p. 151.

CHIMIA ANALITYCZNA. Warszawa, Poland, No. 8, August 1959.

Monthly List of East Accessions (EEAI) LC, Vol. 8, No. 11
November 1959.

Uncl.

KIELCZEWSKI, Wladyslaw; TOMKOWIAK, Jan

Determination of microgram amounts of cyanide by means of impregnated
filter paper. Chem anal 5 no.6:889-892 '60. (EEAI 10:9)

1. Department of General Chemistry, School of Agriculture, Poznan.
(Cyanides)

KIELCZEWSKI, Wladyslaw; TOMKOWIAK, Jan

Determination of microgram amounts of silver by means of the
paper impregnation method. Chem anal 7 no.5:925-929 '62.

1. Department of General Chemistry, School of Agriculture, Poznan.

KIELCZEWSKI, Wladyslaw

W. L. D.

KIELCZEWSKI, Wladyslaw

Department of General Chemistry of the Poznan Institute
of Technology School (Institute of Technology of the
University of Poznan, Poznan)

Poznan, Wielka Jagiellonska, 60-6, 19-00, Poland.

"Application of Anion exchange for quantitative deter-
mination of silver and cesium."

KIELCZEWSKI, Wladyslaw; SUPINSKI, Janusz

Determination of microgram amounts of cobalt by the paper impregnation method. Chem anal 8 no.1:59-62 '63.

1. Department of General Chemistry, School of Agriculture, Poznan.

KIELCZEWSKI, Wladyslaw; MIOSZEWSKA-PODOLAK, Irena

Determination of microamounts of pyrocatechol by the filter paper impregnation method. Chem Anal 8 no.1:95-98 '63.

1. Department of General Chemistry, School of Agriculture, Poznan.

KIELCZEWSKI, Wladyslaw

Application of anion exchanger for quantitative separation of silver and copper. Chem anal 8 no.5:691-693 '63.

1. Department of General Chemistry, School of Agriculture, Poznan.

(C)
POLAND

KIELCZEWSKI, Vladyslav, prof. dr; UCHMAN, Waldemar, mgr

Dept. of General Chemistry, Agricultural College (Katedra Chemii
Ogolnej Wyzszej Szkoły Rolniczej), Poznan (for both)

Warsaw, Chemia analityczna, No 3, May-June 1966, pp 543-545

"Determination of nitrites and nitrates by paper-impregnation method."

BIERNAT, Stanislaw; KIELCZYNsKA, Krystyna

A case of cystic lung degeneration in a 4-month-old infant. Pediat.
Pol. 37 no.1:83-88 Ja '62.

1. Z Zakladu Anatomii Patologicznej WAM w Lodzi Kierownik: prof. dr
med. A. Pruszczynski i ze Szpitala Chorob Dziecięcych im. Jakubowskiego
w Lodzi Dyrektor: dr med. H. Konczynski.

(LUNG DISEASES in inf & child)

WESOLOWSKI, Kornel; KIEDRZYNISKI, Zdzislaw

Ultrasonic analysis of lead-antimony and lead-tin alloys.
Metal i odlew no.7:207-220 '61.

1. Katedra Metaloznawstwa, Politechnika, Warszawa.

KIELEK, W. mgr inz.

Transistor counting decades. Lacznosc Wroclaw 5:42-54 '62.

~~Gating circuits used in digital time and frequency reading meters.~~ 79-85

Frequency reducers used in digital frequency and time meters. 86-90.

The FL-25-61 electronic frequency and time meter. 101-104

The electronic millisecond meter, model SL 95. 105-106

1. Katedra Urzadzen Radiotechnicznych, Politechnika, Warszawa.

U 52153-65

ACCESSION NR: AP5011486

FD/0026/05/013/001/0057/0064

AUTHOR: Jankowski, J.; Klejek, W.; Romaniuk, W.

27

TITLE: Type TMP-1 transistor proton magnetometer

25

SOURCE: Acta geophysica polonica, v. 13, no. 1, 1965, 57-64

B

TOPIC THGS: magnetometer, transistor, transistor proton magnetometer, signal, precession, pulse, pulse compression, pulse counter, pulse generator, frequency, gate, limiting circuit, forming circuit, circuit, control design, signal generator, TMP-1 magnetometer

ABSTRACT: This article describes the design and control measurements of a TMP-1 magnetometer. Particular attention is paid to the induction circuit of the precession signal, inasmuch as it has not yet been adequately developed and causes great difficulties. The electronic circuit that measures the precision frequency is a typical circuit but with a larger number of elements. Particular attention is also paid to the accuracy of the measurements, and sources of error are discussed. The assembly of the magnetometer is shown in Fig. 1 of the Enclosure. After its amplification the precession signal remains in forming circuit UF as a standard

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ACCESSION NR: AF5011486

and a limited pulse. In this form it gets to binary frequency reducer OB1, which is set by a cancel circuit so that the first pulse at its outlet appears after 145 input pulses are received. Thus two electric pulses separated by 1024 or 2048 periods of input voltage are generated. The first of these pulses is retarded by about 70 msec with respect to the front of the precession signal. These pulses control the control circuit that opens gate B. When the gate is open a series of pulses of 100 kilocycles travel from a standard quartz generator to the inlet of a five-decade electronic counter equipped with an indicator. The number of standard time units (10 msec) that elapse between the first and second pulse at the outlet of the binary frequency reducer OB1 appears on the indicator. The performance of the magnetometer is controlled by the inclusion of control voltage of a frequency of 1.5625 kilocycles from an additional binary reducer OB2 at the inlet of the limiting circuit and the forming circuit to reduce the standard frequency of 100 kilocycles. For the correct operation of the entire circuit the measurement of 2048 periods of control voltage must amount to $131072 + 1$ tenths of a msec. Measurements made at observatories under field conditions and in water show that the magnetometer is efficient, that the systematic error is of the order of 1%, that the accidental error is of the order of 0.3%, and that the measurement time is 6 sec. "The authors thank Engineer Andrzej Rudaki for valuable discussions and cooperation." Orig. art. has 15 formulas and 6 figures.

Card 2/4

102152-01

ASSOCIATION-NR: AR5011486

ASSOCIATION: Zaklad Geofiziki PAN (Department of Geophysics, PAN)

SUBMITTED: 28 Oct 64

ENCL: 01

SUB CODE: ES, EC

NO REP. BOTS: 003

OTHER: 007

Card 3/4

L 52153-65

ACCESSION #R: AP5011486

ENCLOSURE: 01

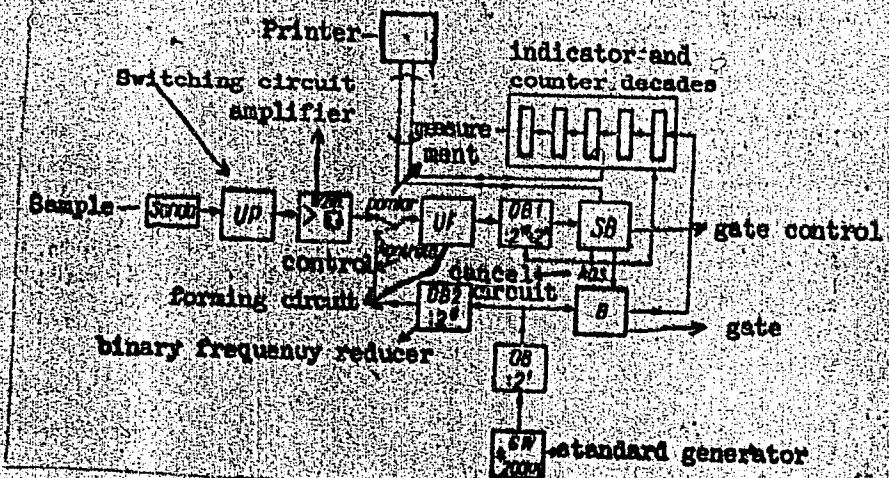


Fig. 1. Block diagram of the TMP-1 magnetometer

Card 4/4 ALAP

34219
S/057/62/032/002/021/022
B124/B102

26.2311

AUTHORS: Zolototrubov, I. M., Novikov, Yu. N., and Kielev, V. A.

TITLE: Electrodynamiс excitation of shock waves

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 32, no. 2, 1962, 253 - 255

TEXT: The electrodynamiс method described by John Marshall (Second International Conference on the Peaceful Uses of Atomic Energy, Geneva, 1958) was used to excite shock waves in a tube with continuous flow of an inert gas. The basic diagram of the setup used is shown in Fig. 1 and has been described in detail by the authors (ZhTF, 31, 5, 518, 1961), where it has been used to preheat the plasma. The maximum magnetic field below the single-turn coil was 45 kilogauss and the discharge took 6 usec. It has been established that the moments of rise of the shock waves correspond to the zeros of the magnetic field (or to the maximum induction e. m. f.). The maximum propagation rate of the shock wave ($7.5 \cdot 10^6$ cm/sec) occurs in the third halfperiod of the current when the gas around the coil has been sufficiently ionized by the waves of the preceding halfperiods. Since the alternating magnetic field depends on the distance from the coil, the

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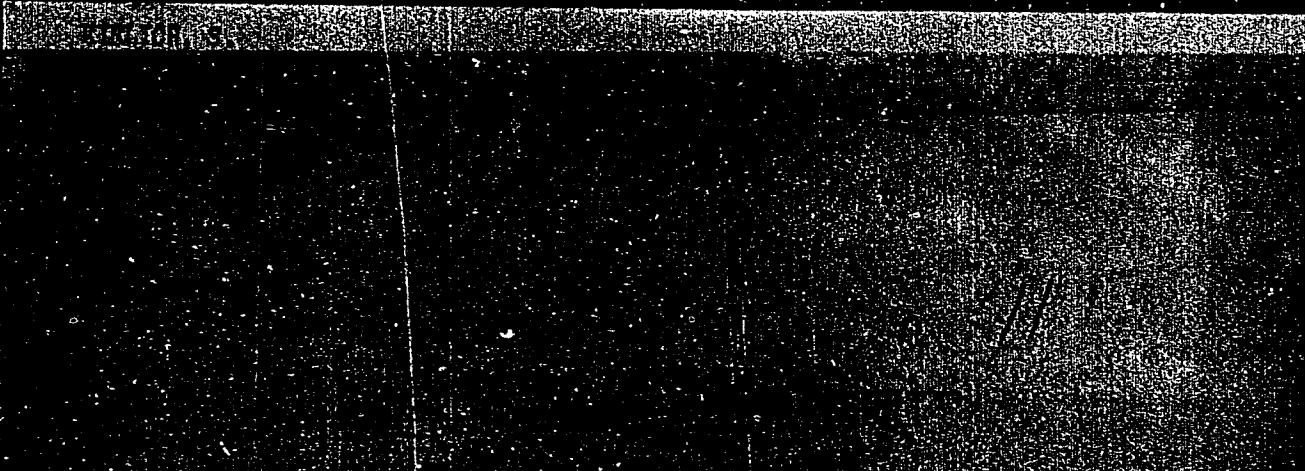
APPROVED FOR RELEASE

S. Kielich

✓ Theory of magnetic birefringence and other phenomena of molecular orientation in diamagnetic liquids? A. Pickara and S. Kielich (Univ. Adam Mickiewicz, Poznan, Poland). *J. Phys. Warsaw* 18, 499-7 (1957); cf. *C.A.* 51, 1674g. — Elec. birefringence, dielec. polarization, effect of the elec. field on the dielec. permittivity, and effect of the magnetic field on the elec. permittivity are called. It is assumed that the mols. are anisotropic with respect to their optical, elec., and magnetic properties and are subject to interaction with surrounding mols. The variation of the dielec. permittivity resulting from the effect of the magnetic field is related to the Cotton-Mouton and Kerr consts. Values for this variation are obtained for nitrobenzene in a magnetic field by assuming a Lorentz field or Onsager field. The molar Cotton-Mouton const. of PhNO_2 in a nonpolar solvent rises rapidly with the concn., whereas the elec. satn. of the dielec. polarization changes its sign to pos. H. R.

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APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000722510020-2"

KIELICH, S.

POLAND/Optics - Physical Optics

K-5

Abs Jour : Ref Zhur - Fizika, No 2, 1959, No 4241

Author : Kielich S.

Inst : Institute of Physics, Poznan, Poland

Title : Molecular Interaction in the Classical Theory of Light Scattering.

Orig Pub : Bull. Acad. polon. sci. Ser. sci. math., astron. et phys., 1958, 6, No 3, 215-221, XVI

Abstract : A theory is proposed for the influence of molecular interaction between optical anisotropic molecules on scattering of light in liquids. General formulas are obtained for the connection between the depolarization of the scattered light D_n and the scattering constant R , on the one hand, and the average cosines of the angles between the axes of the molecules (which figure also in the constants C and the Kerr constants K) on the other. For the

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particular case, when the tensor of the polarizability of an individual molecule has an axial symmetry, these formulas

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KIELICH, S.

21
Some phenomena of molecular orientation due to electric
and magnetic fields. A. Piekarz and S. Kielich (Polish
Acad. Sci., Poznan). *Arch. sci. (Geneva)* II, Spec. No.
304-9 (1958). — The elec., magnetic, and optical effects to be
expected in the regions of nonlinearity, i.e., under conditions
of satn. by the same or another influence, are discussed.
Formulas are given for the expected changes in dielec. const.,
magnetic permeability, or n . James H. Pahmiller

3

ρ_{air}^2

POLAND/Electricity - Dielectric

Abs Jour : Ref Zhur - Fizika, No 6, 1959, 13299
Author : Piekara, A., Kielich, S.
Inst : Institute of Physics, Polish Academy of Sciences, University in the Name of A. Mickiewicz, Poznan, Poland
Title : A Nonlinear Theory of the Electric Permittivity and Refractivity of Dielectric Liquids in Electric and Magnetic Fields.
Orig Pub : Acta Phys. polon., 1958, 17, No 4, 209-238
Abstract : A general molecular theory is given for the nonlinear effects of the orientation of molecules, produced in gases and dielectric liquid by the application of electric and magnetic fields. The following molar constants are calculated: the dielectric polarization, the Cotton-Mouton constant, the Kerr constant, and the constant of dielectric

Card 1/2

POLAND/Electricity - Dielectric.

Abs Jour : Ref Zhur - Fizika, No 6, 1959, 13299

saturation in an electric and magnetic field for gases and liquids. For liquids, whose molecules have an axial symmetry, the authors calculate the correlation factors pertaining to these constants factors which determine the interaction between the molecules in the liquid. No special assumptions are made in the derivation of the correlation factors as regards the nature of the forces acting between the molecules. For the case of an interaction leading to the production of dipole pairs, formulas are obtained (proven previously by one of the authors), in which the inversion of dielectric saturation is taken into account. Finally, a relation is derived between the change in the dielectric constant in a magnetic field and the Kerr constant or the Cotton-Mouton constant, and an estimate is made of the order of magnitude in the change of the dielectric constant in a magnetic field. Bibliography, 26 titles.

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- 79 -

POLAND/Electricity - Dielectric.

Abs Jour : Ref Zhur - Fizika, No 6, 1959, 13300
Author : Kielich, S.
Inst : Institute of Physics, Polish Academy of Sciences,
Poznan, Poland
Title : Semi-Macroscopic Treatment of the Theory of Nonlinear
Phenomena in Dielectric Liquids Submitted to Strong and
Magnetic Fields.
Orig Pub : Acta phys. polon., 1958, 17, No 4, 239-255
Abstract : A general semi-macroscopic theory is constructed for the
nonlinear effects of orientation of molecules, caused in
liquids by strong electric and magnetic fields. The de-
viation from the quadratic effect of the dielectric satu-
ration in strong electric fields is calculated for polar
liquids with isotropically polarizable molecules.

Card 1/2

KIELICH, S

Distr: 4E3d

✓ Theory of orientational effects and related phenomena in dielectric liquids. A. Plekara and S. Kielich (A. Mickiewicz Univ., Poznan, Poland). *J. Chem. Phys.* 29, 1297-1305 (1958); cf. *Acta Phys. Polonica* 18, 200 (1968).— Formulas were developed for the molar const. of 5 nonlinear effects of mol. orientation in liquids, namely, the dielectric satn. in elec., magnetic, or optical fields and the elec. as well as the magnetic birefringence. No assumption was made concerning the nature of the intermol. forces, and no special model of mol. interaction was introduced. If the mols. can be considered to possess axial symmetry, 4 correlation factors can be derived. These factors appear in the formulas of the molar consts. of the Cotton-Mouton and Kerr effects, and of the effect of dielect. satn. in an elec., magnetic, or optical field. The correlation factors were calcd. as functions of the angle between the axes of symmetry of the pth and qth mols., in the absence of a biasing field. The theory makes it possible to predict the value of the magnetodielectric satn. effect in diamagnetic liquids, as well as the photodielectric satn., relating these phenomena to magnetic or elec. birefringence. Satisfactory results were obtained by applying the theory to such phenomena as light scattering in liquids or the lowering of the f.p., in which the orientationally dependent intermol. forces play an important part.

Henry Leidheiser

67145

24.2100

24 (3)

AUTHORS:

Kielich, S., Fickara, A.

FOL/45-18-5-5/11

TITLE:

A Statistical Molecular Theory of Electric, Magnetic and Optical Saturation Phenomena in Isotropic Dielectric and Diamagnetic Media

PERIODICAL:

Acta Physica Polonica, 1959, Vol 18, Nr 5, pp 439-471 (Poland)

ABSTRACT:

The present paper aims at establishing a unified theory of the nine electric, magnetic and optical saturation phenomena in substances of the above mentioned properties (gases, condensed gases, fluids). For condensed media composed of polar molecules of arbitrary symmetry, anisotropically polarizable and non-linearly deformable in an external field, general expressions yielding the nine molar constants have been derived, namely: Group I - electric saturation: S_M^{ee} in an electric, S_M^{em} in a magnetic and S_M^{eo} in an optical field.

Group II - magnetic saturation: S_M^{me} in an electric, S_M^{mm} in a magnetic and S_M^{mo} in an optical field.

Group III - optical saturation: S_M^{oe} in an electric, S_M^{om} in a

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A Statistical Molecular Theory of Electric, Magnetic and Optical Saturation Phenomena in Isotropic Dielectric and Diamagnetic Media

101/45-18-5-5/11

magnetic and S_M^{OO} in an optical field.

A discussion of these molar constants is given for particular cases of spherical and axial symmetry of the molecules. For axial symmetry, the general formulas are reduced to those given previously. Moreover, expressions have been derived relating the above mentioned molar constants to the variations of the electric permittivity, of the magnetic permeability and of the optical refractive index of the medium, as resulting from the action thereon of a strong polarizing electric, magnetic or optical field. Only three of the nine possible effects under consideration have been detected until now, namely the electrooptical Kerr effect, the magneto-optical Cotton-Mouton effect, and the electric saturation in an electric field, i.e. electro-electric saturation. The authors derived equations for computing each of the six as yet unknown quantities from the known experimental Kerr and Cotton-Mouton constants. By these formulas the variations in permittivity, permeability and refractive index under the action of respective fields have been numerically computed for nitro- 4

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A Statistical Molecular Theory of Electric, Magnetic and Optical Saturation Phenomena in Isotropic Dielectric and Diamagnetic Media

POL/45-18-5-5/11
benzene. There are 1 table and 41 references, 1 of which is
Soviet.

ASSOCIATION: Institute of Physics, Polish Academy of Sciences; A. Mickiewicz
University, Poznań

SUBMITTED: February 16, 1959

4

Card 3/3

KIELICH, S.

Theory of birefringence induced in a compressed gas mixture by an electric field gradient. Bul Ac Pol mat 8 no.9:637-641 '60.

1. Institute of Physics, Poznan Branch, Polish Academy of Sciences.
Presented by W. Rubinowicz.

(Gases) (Mixtures)

P/045/60/019/02/04/013
B018/B102

AUTHOR: Kielich, S.

TITLE: A Molecular Theory of Light Scattering in Gases and Liquids

PERIODICAL: Acta Physica Polonica, 1960, Vol. 19, No. 2, pp. 149-178

TEXT: The author of the present paper gives an account on the general principles of a statistical molecular theory of light scattering in an isotropic medium which consists of polar anisotropic molecules. Previous work on related subjects is discussed in an introductory note; Smoluchowski (1908) was the first to prove that light scattering in optically homogeneous media arises from spontaneous thermal fluctuations of their density. The author derived a fundamental and general equation for the scattered intensity I . This equation contains the molecular factors F_{is} and F_{anis} which account for isotropic and anisotropic light scattering brought about by the molecules of the medium. These molecular factors are discussed in detail for the case of gases and liquids with molecules small as compared to the wavelength of the incident light. In such gases and liquids, F_{is} depends

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A Molecular Theory of Light Scattering
in Gases and Liquids

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B018/B102

on the mean polarizability of the molecule and on the radial intermolecular correlations, whereas F_{anis} depends on the symmetry and anisotropy of molecule polarizability and on the orientational intermolecular correlations. From the fundamental equation for the scattered intensity, general expressions for the optical anisotropy Δ^2 and for the degree of depolarization D of the scattered light, and for Rayleigh's ratio S and the extinction coefficient h are derived. For perfect gases, these expressions are reduced to the known formulas of Rayleigh-Born-Cabannes. For liquids with axially symmetric molecules, the expressions obtained for D , S , and h differ from those of Cabannes-King-Rocard in their anisotropic terms by the angular correlation factor R_{CM} which also appears in the formulas for the Cotton-Mouton and Kerr constants. In the case of compressed gases, the molecular factors F_{is} and F_{anis} are expanded into a power-

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A Molecular Theory of Light Scattering
in Gases and Liquids

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B018/B102

series of $1/V$ (V denotes the volume of the system). The virial coefficients (first, second, third, etc. termed A, B, C, etc plus respective indices) of isotropic and anisotropic light scattering are calculated for spherical molecules of variable polarizability and for anisotropic axially symmetric molecules which have a permanent dipole moment. Moreover, following Buckingham's method, the effect of the internal molecular field and the hyperpolarizability of molecules on light scattering in liquids is discussed. Finally, general relations between the quantities D, S, and h and formulas relating these quantities and the anisotropic term in Kerr's constant K_{anis} are derived. The relations thus obtained do not contain any molecular parameters and may serve for verifying the theory by experiments. In conclusion, the author expresses his gratitude to Professor Doctor A. Piekara for valuable advice and to Doctor A. D. Buckingham for stimulating discussions. There are 2 figures and 30 references, 2 of which are Soviet.

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A Molecular Theory of Light Scattering
in Gases and Liquids

P/045/60/019/02/04/013
B018/B102

ASSOCIATION: Institute of Physics, Polish Academy of Sciences, Poznań
SUBMITTED: June 15, 1959

Card 4/4

✓C

84918

P/045/60/019/005/004/005
B011/B059

24.3600 (1106,1114,1144)

AUTHOR: Kielich, S.TITLE: Molecular Theory of Light Scatter by Multi-component SystemsPERIODICAL: Acta Physica Polonica, 1960, Vol. 19, No. 5, pp. 573 - 597
(Poland)

TEXT: In the present paper, a general statistical-molecular theory of light scatter by multi-component systems of optically anisotropic and polar molecules is proposed. The general theory is based on the theory of Rayleigh scattering by an isotropic medium of spherical shape. The intensity component of the light scattered by the volume V and passing through the analyzing Nicol prism at the point of observation is, quite generally, given by

$$I_n = \frac{16\pi^4}{\lambda^4 R_o^2} \left\langle M_\alpha M_\beta^* n_\alpha n_\beta \right\rangle_E \quad (\text{see Kielich 1960}),$$

where R_o denotes the distance between the point of observation and the

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Molecular Theory of Light Scatter by
Multi-component Systems

P/045/60/019/005/004/005
B011/B059

center of the scattering volume V ; \vec{n} is the unit vector perpendicular to the direction of observation and describing the plane of oscillations of the Nicol prism. α and β are summational indices running from 1 to 3. The asterisk denotes the complex-conjugate quantity. M stands for the dipole moment induced in V by the electric field \vec{E} of the incident light beam, and depends on the position and orientation of all molecules in the system. The symbol $\langle M_\alpha M_\beta^* n_\alpha n_\beta \rangle_{\vec{E}}$ in the above equation denotes the statistical mean in the presence of \vec{E} . Assuming linear dependence of \vec{M} on \vec{E} , the fundamental equation (2.9), together with the molecular factors of isotropic and anisotropic light scatter, F_{is} and F_{anis} , is obtained in the following form:

$$I_p = \frac{16 \pi^4 I_0}{45 \lambda^4 R^4} \{5 \cos^2 \Omega_m F_{is}(s) + (\cos^2 \Omega_m + 3) F_{anis}(s)\} \quad (2.9)$$

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Molecular Theory of Light Scatter by
Multi-component SystemsP/045/60/019/005/004/005
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$$F_{is}(s) = \sum_{i,j} \left\langle \delta_{\alpha\beta} \delta_{\gamma\delta} \sum_{p=1}^{x_i N} \sum_{q=1}^{x_j N} \frac{\partial m_a^{(p,i)}}{\partial E_\beta^{(p,i)}} \left(\frac{\partial m_y^{(q,j)}}{\partial E_\delta^{(q,j)}} \right)^* e^{-is \cdot r_{ij}^{(p,q)}} \right\rangle. \quad (2.10)$$

$$F_{anis}(s) = \frac{1}{2} \sum_{i,j} \left\langle (3 \delta_{\alpha\gamma} \delta_{\beta\delta} - \delta_{\alpha\beta} \delta_{\gamma\delta}) \sum_{p=1}^{x_i N} \sum_{q=1}^{x_j N} \frac{\partial m_a^{(p,i)}}{\partial E_\beta^{(p,i)}} \left(\frac{\partial m_y^{(q,j)}}{\partial E_\delta^{(q,j)}} \right)^* e^{-is \cdot r_{ij}^{(p,q)}} \right\rangle, \quad (2.11)$$

$\Omega_{en(pq)}$ denotes the angle between \vec{e} (a unit vector in the direction of \vec{E}) and \vec{r} ; $\vec{r}_{ij}^{(pq)} = \vec{r}_j^{(q)} - \vec{r}_i^{(p)}$ is the vector connecting the centers of the p-th and q-th molecules of the i-th and j-th kind. In the following, the author discusses the factors F_{is} and F_{anis} for several molecular models, such as anisotropic molecules with constant polarizability, molecules with permanent dipole moments and hyperpolarizability - here, articles by Buckingham and Stephen (1957), Onsager (1936), and Piekarz (1950) served as a basis -.

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Molecular Theory of Light Scatter by
Multi-component Systems

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B011/B059

and non-dipolar molecules with quadrupole moments and hyperpolarizability. These discussions show that the molecular factors of isotropic and anisotropic light scatter contain molecular constants accounting for the electro-optical properties of isolated molecules, such as polarizability, hyperpolarizability, and permanent dipole or quadrupole moments. Moreover, F_{is} depends on the radial intermolecular correlations, whereas F_{anis} depends on the angular intermolecular correlations. For the greater part, the values of these molecular parameters are not known, and so F_{is} and F_{anis} are more conveniently expressed by quantities that are accessible to measurement. A relation between anisotropic light scatter and optical birefringence arising in an isotropic medium due to the effect of a very intense light beam, is derived by generalizing Buckingham's theory (Ref. 6; 1956) to multi-component systems. Furthermore, it is proved that F_{is} can be expressed in terms of the molecular refraction of the medium. From the present paper it results that in a multi-component system, in addition to light scatter on fluctuations of density and concentration, as well as of anisotropy and orientation of the molecules, an essential part is played by light scatter

Card 4/5

86670

P/045/60/010/006/009/012
B011/B059

24.5400

AUTHOR: Kielich, S.

TITLE: Rayleigh's Ratio and the Turbidity of Imperfect Gases

PERIODICAL: Acta Physica Polonica, 1960, Vol. 19, No. 6, pp. 711 - 730

TEXT: According to the author, information on the nature of intermolecular forces may be obtained from the divergence between light scatter in a compressed and in an ideal gas. For this reason the author suggests a theory of the virial coefficient for Rayleigh's ratio S and the turbidity h of imperfect gases. By statistical mechanics of classical light scatter, S and h are given by formulas (2.1) and (2.2) which contain the molecular S_m^{is} and S_m^{anis} of isotropic and anisotropic light scatter, respectively.

Here, these constants are expanded in powers of $1/V$ (V - molar volume of the scattering medium with refractive index n). The coefficients of this expansion are termed the virial coefficients of isotropic and anisotropic light scatter, respectively. The first virial coefficients account for

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Rayleigh's Ratio and the Turbidity of
Imperfect Gases

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light scatter in an ideal gas, the second for a gas with a pairwise interaction between the molecules, the third for interaction of three molecules, and so forth. The second virial coefficients are calculated for various models of dipole and quadrupole molecules. In the first approximation, a molecule of the imperfect gas is assumed to possess the polarizability of an isolated molecule. In further approximations to this theory, the molecules are assumed to have a polarizability that is affected by their neighbors, and to exhibit the effect of hyperpolarizability. Using the formulas obtained, the second virial coefficients are computed for various dipole gases (Table II). Professor Doctor A. Piekara is thanked for helpful discussions. There are 2 tables and 15 references: 7 US, 6 British, 1 Polish, and 1 French.

ASSOCIATION: Institute of Physics, Polish Academy of Sciences, Poznan'

SUBMITTED: April 28, 1960

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86670

P/045/60/019/006/009/012
B011/B059Table II. Theoretical values of virial coefficients B_S^{10} and B_S^{anis} of light scattering, in cm^3/mol^2 .

		central-forces potential	dipole-induced dipole interaction	dipole-dipole interaction	total
NH_3	$B_S^{10} \times 10^4$	7.36	6.63	32.11	46.10
	$B_S^{\text{anis}} \times 10^4$	0	0.003	0.45	0.453
CH_3F	$B_S^{10} \times 10^4$	9.06	4.53	20.83	34.42
	$B_S^{\text{anis}} \times 10^4$	0	0.02	3.04	3.06
CH_3CN	$B_S^{10} \times 10^4$	153.72	67.64	707.11	928.47
	$B_S^{\text{anis}} \times 10^4$	0	0.2	113.0	113.20

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$$S = \frac{(n^2 + 2)^2}{9V} (S_m^{ls} + S_m^{ans}), \quad (2.1)$$

$$h = \frac{16\pi(n^2 + 2)^2}{27V} \left(S_m^{ls} + \frac{5}{13} S_m^{ans} \right), \quad (2.2)$$

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100-380

6,4780
24,3200 (1051,1106,1114)

P/045/61/020/001/005/006
B108/B209

AUTHOR: Kielich, S.

TITLE: Supplementary note to the paper: Molecular Theory of Light Scattering by Multi-component Systems

PERIODICAL: Acta Physica Polonica, v. 20, no. 1, 1961, 83-88

TEXT: The present article is to supplement an earlier paper (S. Kielich, Acta phys. Polon., 19, 573 (1960)) and brings a discussion of the scattered light intensity for the case of a system whose various components consist of quadrupolar, anisotropically polarizable and hyperpolarizable molecules. The light intensity scattered through an angle θ is given by formula

$$I(\theta) = \frac{8\pi^4 I_0}{45 \lambda^4 R_0^8} \{5(1 + \cos^2 \theta) F_h(s) + (13 + \cos^2 \theta) F_{anis}(s)\} \quad (1)$$

where I_0 and λ denote intensity and wave-length, respectively, of the
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Supplementary note to the paper: ...

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B108/B209

incident light, R_0 - the distance of the observer from the scattering center. $F_{is}(s)$ and $F_{anis}(s)$ are the molecular factors of isotropic and anisotropic light scattering. (Kielich, 1960). The expansion

$$\left(\frac{\partial m_{\alpha}^{(p,i)}}{\partial E_x^{(p,i)}} \right)_{E=0} = \left\{ \alpha_{\alpha\beta}^{(p,i)} + \beta_{\alpha\beta\gamma}^{(p,i)} F_{\gamma}^{(p,i)} + \frac{1}{2} \gamma_{\alpha\beta\gamma\delta}^{(p,i)} F_{\gamma}^{(p,i)} F_{\delta}^{(p,i)} + \right. \\ \left. + \frac{1}{3} B_{\alpha\beta\gamma\delta}^{(p,i)} F_{\gamma\delta}^{(p,i)} + \dots \right\} \left\{ \delta_{\beta x} + \frac{\partial F_{\beta}^{(p,i)}}{\partial E_x^{(p,i)}} \right\}_{E=0}, \quad (4)$$

for the total differential polarizability tensor of the molecule in the medium (for $E = 0$) is substituted in the expressions for F_{is} and F_{anis} . The notations are as follows:

$\alpha_{\alpha\beta}^{(p,i)}$ - polarizability tensor of the p-th molecule of species i,

$\beta_{\alpha\beta\gamma}^{(p,i)}$, $\gamma_{\alpha\beta\gamma\delta}^{(p,i)}$ - hyperpolarizability tensors. The tensor $B_{\alpha\beta\gamma\delta}^{(p,i)}$ accounts for the additional polarization of the p-th molecule of species i

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Supplementary note to the paper: ...

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B108/B209

as induced by the field gradient $F_{\alpha\beta}^{(p,i)}$ at the center of molecule p of species i , which is due to the electric-charge distributions of all the other molecules in the presence of the electric field E_α . $F_\alpha^{(p,i)}$ denotes the α -component of the molecular field. For non-dipolar molecules with axial symmetry, the following tensor elements only are non-vanishing: $\alpha_{\alpha\beta}$, $\theta_{\alpha\beta}$, $\gamma_{\alpha\beta\gamma\delta}$, $B_{\alpha\beta\gamma\delta}$ (axis of symmetry parallel to O_3 , see A. D. Buckingham, J. chem. Phys., 30, 1580 (1959)).

$$\begin{aligned} \alpha_{11} &= \alpha_{22} = \alpha_{\perp}, & \gamma_{1111} &= \gamma_{2222} = 3\gamma_{1122} = \gamma_{\perp}, & \gamma_{1133} &= \gamma_{2233} = \gamma_{\parallel}, \\ \alpha_{33} &= \alpha_{\parallel}, & \gamma_{3333} &= \gamma_{\parallel}, & \theta_{33} &= -2\theta_{11} = -2\theta_{22} = \theta, \\ B_{33:33} &= -2B_{33:11} = -2B_{33:22} = 2(B_{11:11} + B_{11:22}) = B, \end{aligned} \quad (15)$$

where θ is the quadrupole moment and B the quadrupole polarizability of the

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Supplementary note to the paper: ...

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B108/B209

molecule. With respect to (15) and for $\lambda \gg r_{ij}$, F_{is} and F_{anis} assume the forms

$$F_{is} = 9N \sum_{i,j} \alpha_{(i)} \alpha_{(j)} \{1 + A_{is}^{(ij)} + H_{is}^{(ij)}\} \times \\ \times \left\{ x_i \delta_{ij} + x_i x_j \int \left[g_{ij}(\tau) - \frac{N}{V} \right] d\tau \right\}, \quad (16)$$

$$F_{anis} = 9N \sum_{i,j} \alpha_{(i)} \delta_{s(i)} \alpha_{(j)} \delta_{s(j)} \{1 + A_{anis}^{(ij)} + H_{anis}^{(ij)}\} \times \\ \times \left\{ x_i \delta_{ij} + \frac{1}{2} x_i x_j \int (3 \cos^2 \Theta_{ij} - 1) \left[g_{ij}(\tau) - \frac{N}{V} \right] d\tau \right\}, \quad (17)$$

Here, Θ_{ij} denotes the angle between the axes of symmetry of the molecules of species i and j . $g_{ij}(\tau)$ - the distribution function and $\Omega^2 d\tau = d\vec{r}_{ij} d\omega_i d\omega_j$, where $\Omega = \int d\omega_i$. The quantities $A_{is}^{(ij)}$ and $A_{anis}^{(ij)}$ in

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Supplementary note to the paper: ...

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$$A_{\text{B}}^{(ij)} = \frac{1}{2} (\lambda_{||}^{(i)} \psi_{||}^{(i)} + 2\lambda_{\perp}^{(i)} \psi_{\perp}^{(i)}) + \frac{1}{2} (\lambda_{||}^{(j)} \psi_{||}^{(j)} + 2\lambda_{\perp}^{(j)} \psi_{\perp}^{(j)}) + \frac{1}{2} (\lambda_{||}^{(i)} \psi_{||}^{(i)} + 2\lambda_{\perp}^{(i)} \psi_{\perp}^{(i)}) (\lambda_{||}^{(j)} \psi_{||}^{(j)} + 2\lambda_{\perp}^{(j)} \psi_{\perp}^{(j)}). \quad (18)$$

$$A_{\text{anis}}^{(ij)} = \frac{\lambda_{||}^{(i)} \psi_{||}^{(i)} - \lambda_{\perp}^{(i)} \psi_{\perp}^{(i)}}{\lambda_{||}^{(i)} - \lambda_{\perp}^{(i)}} + \frac{\lambda_{||}^{(j)} \psi_{||}^{(j)} - \lambda_{\perp}^{(j)} \psi_{\perp}^{(j)}}{\lambda_{||}^{(j)} - \lambda_{\perp}^{(j)}}.$$

and

$$+ \left(\frac{\lambda_{||}^{(i)} \psi_{||}^{(i)} - \lambda_{\perp}^{(i)} \psi_{\perp}^{(i)}}{\lambda_{||}^{(i)} - \lambda_{\perp}^{(i)}} \right) \left(\frac{\lambda_{||}^{(j)} \psi_{||}^{(j)} - \lambda_{\perp}^{(j)} \psi_{\perp}^{(j)}}{\lambda_{||}^{(j)} - \lambda_{\perp}^{(j)}} \right). \quad (19)$$

account for the effect of the anisotropy of the molecular field on isotropic and anisotropic light scattering, respectively.

$H_{\text{is}}^{(ij)}$ and $H_{\text{anis}}^{(ij)}$ account for the additional contribution to isotropic and anisotropic light scattering due to higher-order effects such as hyperpolarizability of the molecules and polarizability of molecular quadrupoles.

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